

PROJECT DEVELOPMENT PLAN  
SURFACE WATER TREATMENT PLANT  
FACILITIES PLAN  
FOR THE  
CONFEDERATED TRIBES OF THE WARM SPRINGS  
INDIAN RESERVATION  
OREGON

PL-86-121  
IHS PROJECT NO. PO-13-L71

AUGUST 2013

**I. Synopsis**

The Confederated Tribes of Warm Springs (Tribe) have requested Indian Health Service (IHS) assistance with developing a facilities plan for an overall assessment of its Dry Creek Surface Water Treatment Plant (SWTP). In particular, the plan is needed to address the requirements to comply with the Environmental Protection Agency (EPA) Surface Water Treatment Rule (SWTR) while meeting the potable water demand of the Warm Springs community. The outcome of this planning project will be an Engineering Project Report that will provide a complete assessment of the SWTP, including the current and potential capacity, and prioritized list of capital improvements and replacement alternatives. The total estimated cost of this planning project is \$165,000.00.

This project is a cooperative effort between the Tribe, IHS, and the EPA under the Tribal Set Aside provisions of the Safe Drinking Water Act (SDWA). The Tribe will contract for the described necessary services through Tribal procurement. IHS will provide technical assistance to the Tribe to ensure that the resultant deliverables and recommendations are technically sound, provide a basis for subsequent plant operation and maintenance changes, and justify potential improvements to the facilities. IHS will assist the Tribe in developing solicitation documents, selecting qualified service providers, negotiating scopes of work, and reviewing deliverables. IHS will evaluate project alternatives and prepare an Engineering Project Report (EPR) with input and involvement from the Tribe. This project will be funded with \$93,679.00 in IHS Regular funds and \$71,321.00 in EPA-SDWA funds.

**II. Project Background and Need**

The SWTP serving the Warm Springs community was constructed in the early 1980's and has about 700 service connections. The SWTP uses conventional treatment (coagulation, flocculation, sedimentation and filtration) to treat water from the Deschutes River. Filtered water is disinfected with chlorine and is pumped from the SWTP into the distribution system and multiple storage tanks.

Over the past thirty years of operations, numerous upgrades to equipment, electrical and controls have been made in the SWTP. The control system was completely replaced in 2000 automating many of the plant's functions. Composite as-builts of the plant have not been maintained, thus complicating the ability to provide maintenance, troubleshoot the operation of the physical plant, or provide a reliable basis for planning purposes.

In September of 2008, IHS and EPA conducted a Comprehensive Performance Evaluation of the SWTP, which identified operational and equipment deficiencies in the plant. The findings of the Comprehensive Performance Evaluation were collected in the "Results of the Comprehensive Performance Evaluation of the Confederated Tribes of Warm Springs Dry Creek Water Treatment Plant" report. Items of specific concern in the report were the SWTP's ability to meet the turbidity and disinfection requirements of the SWTR while operating near its full capacity, 4.3 million gallons per day (MGD).

The Tribe has recently introduced the use of granular activated carbon to mitigate seasonal taste and odor problems that occur during the highest seasonal usage periods from late spring to early fall. In response to the change in treatment chemical, IHS and the Tribe developed a project, IHS Project PO-12-Z00, to evaluate the treatment process and recommend the best suited treatment chemicals to optimize the SWTP performance and compliance with the SWTR. PO-12-Z00 and this project, IHS project PO-13-L71, both evaluate the SWTP, but focus on different aspects of the facility.

- **PO-12-Z00** evaluates the treatment process and chemicals currently used and will help the Tribe effectively manage chemical usage. The results of the study will provide recommendations to optimize the treatment process based on existing SWTP equipment to meet the SWTR and the potable water needs of the community. The scope of recommendations is constrained to changes to the treatment chemicals, sequence of chemical addition, and dosing quantities within the existing plant.
- **PO-13-L71** will evaluate facility improvement needs of the SWTP and outline facility capital improvements and equipment replacement options to ensure that the plant can meet the SWTR. Activities under this project include evaluations and assessments of the SWTP capacity and production potential, mechanical and electrical equipment components, and the facility structure.

This project will expand on the 2008 Comprehensive Performance Evaluation and the efforts of Project PO-12-Z00 to provide a comprehensive study and plan for the Tribe to follow in making upgrades, renovations, and/or improvements to meet the requirements of the SWTR and provide for the potable water needs of the community.

### **III. Scope of Work**

The following tasks outline the scope of this PDP and detail the roles for work to be completed under this project. Work provided through the tasks includes updating the existing records of operational equipment and facility plans, an assessment of the SWTP production capacity and system demand, mechanical and electrical condition assessment, site and structural assessment of facilities, and estimating the operational costs of the existing plant and the life cycle cost of the proposed alternatives. All of the findings and results of the completed tasks will be reported in an EPR, which will include recommendations on improvements, upgrades, renovations, and/or replacements of the facilities. The EPR will outline a scope and estimated costs for capital improvement alternatives.

The Tribe will procure the services of a consultant to complete technical and labor intensive information gathering and analysis of the SWTP. Existing information on the SWTP will be made available to the consultant upon request. The Tribe and IHS will work to provide specific and relevant information to the consultant to expedite the development of the composite as-built set. IHS will use the results of the tribally procured services to develop an EPR and present alternatives for capital improvements.

The Tribe will be responsible to coordinate and manage activities with the consultant. IHS will provide technical assistance throughout the project and provide the Request for Proposal (RFP) for selection of a qualified consultant as well the project scope of technical requirements and criteria for completion of services. Additionally, IHS will act as a reviewer and provide recommendations during the RFP process, provide technical review for each task, and participate in meetings and discussions with the Tribe and consultant. IHS will compile the information developed through the PDP tasks and develop the EPR.

Delivery of each of the tasks provided by the Tribe may be provided through multiple targeted procurement efforts. This will ensure the appropriate specialist will be involved on each task.

#### **Task #1 – Compile and Provide Composite As-Builts of Existing Facilities**

Under this task the Tribe will utilize technical requirements provided by IHS to procure the services of a consultant selected through the RFP process to provide a full and complete composite as-built set of the SWTP interior and exterior including all mechanical and electrical components. The task is a significant undertaking as the plant is over 30 years old, and the original as-built drawings have not been updated as major and minor alterations have occurred. The design firm of record is no longer in business, and the drawings are not available in an electronic format. The work under this project will involve developing electronic drawings from the original as-built drawings, field-verifying plant alterations that have occurred over 32 years, and locating and cataloging critical process equipment. This information is necessary for subsequent tasks under this project. Additionally, the development of the drawings has value to the Tribe for their day-

to-day management, maintenance and operation responsibilities of the surface water treatment plant.

Sub-Tasks

- Consolidate existing as-builts and plans from alteration projects into one set. Develop an electronic (AutoCAD) drawing.
- Identify missing, incomplete, or incorrect information through field verification.
- Ensure correct identification of currently existing mechanical and electrical equipment. Catalog the salient attributes of equipment on the drawings.
- Update drawings of both interior and exterior of the SWTP and entire compound (i.e. location of septic system, surface water intake and discharge, and backwash ponds).

Deliverable:

IHS: Technical requirements for RFP and selection of consultant. Technical assistance and review.

Tribe: Full and complete composite as-built plans of SWTP through the Tribally procured consultant.

**Task #2 – SWTP Capacity, Production, and Demand Assessment**

Under this task the Tribe will utilize technical requirements provided by IHS to procure the services of a consultant selected through the RFP process to assess the SWTP's capacity and production of treated water under its current operational state. The plant capacity is the theoretical amount of water the plant can treat under optimal conditions. Under this task, the impacts of variable raw water quality characteristics, staffing capabilities and major treatment component performance will be discussed.

Sub-Tasks

- Determine SWTP capacity for current treatment operations.
- Compile current production data of SWTP and determine average, peak, and maximum daily demands on the SWTP.
- Determine the impact of changing raw water quality characteristics, available staff and major treatment and production components on production and provide comparison to full production capacity potential under optimal conditions.

Deliverable:

IHS: Technical requirements for RFP and selection of consultant. Technical assistance during task progress and review of results.

Tribe: SWTP capacity, production, and demand assessment through the Tribally procured consultant.

### **Task #3 – Mechanical and Electrical Condition Assessment**

Under this task the Tribe will utilize technical requirements provided by IHS to procure the services of a consultant selected through the RFP process to provide full assessment of the condition, functionality, and appropriateness of the mechanical and electrical equipment with regard to treatment, production, distribution and monitoring of SWTP operations. Recommendations on improvements, replacements, or upgrades will be made based on continued use of the existing facilities. The results of this task will provide a basis for which the Tribe can anticipate needed funds for equipment maintenance, repair, and replacement that IHS and the Tribe can utilize for developing capital improvement project alternatives.

#### Sub-Tasks

- Assess age, condition, and remaining useful life of mechanical equipment and electric controls.
- Identify make, model, and technical specifications of all equipment.
- Determine if equipment in use meets the needs of the SWTP as operated and required by the SWTR.
- Make recommendations for equipment replacement including estimated costs.
  1. Alternatives comparison leading to recommendations;
  2. Alternatives compared shall range from no action; leave as-is to full replacement of facilities and equipment.
- Provide priority hierarchy of recommendations based on defined criteria:
  1. Equipment reliability and remaining useful life;
  2. Impacts of equipment failure on SWTP operations;
  3. Impacts of equipment upgrades and improvements on SWTP production and capabilities to meet finished water quality required by SWTP.

#### Deliverable:

- IHS: Technical requirements for RFP and selection of consultant. Technical assistance during task progress and review of results.
- Tribe: SWTP mechanical and electrical equipment assessment and analysis through the Tribally procured consultant.

#### **Task #4 – Site and Structural Assessment**

Under this task the Tribe will utilize technical requirements provided by IHS to procure the services of a consultant selected through the RFP process to provide an assessment of the overall site and structure housing the SWTP and recommend improvements and upgrades. The results of this task will provide a basis for which the Tribe can plan for maintenance and repair and capital improvements. Further, the assessment will include recommendations on the potential and feasibility for repair and upgrades of the SWTP structure compared to full replacement of the facilities.

##### Sub-Tasks

- Assess interior structure of SWTP for integrity, condition of construction materials, storage of treatment chemical materials, and safety of flooring, walls, stairs, and lighting based on mandatory and/or established industry standards (i.e. International Building Code, EPA and Federal regulations on hazardous materials storage, OSHA).
- Assess exterior of SWTP for condition of construction materials and safety including roof, siding/paint, access points, fencing, and paved areas.
- Recommend areas for improvement and identify options for making the improvements.
  1. Alternatives comparison leading to recommendations;
  2. Alternatives compared shall range from no action; leave as-is to full replacement of facilities and equipment;
  3. Full replacement alternative shall take into account space required and availability of land for the Tribe's use in such an endeavor.

##### Deliverable:

IHS: Technical requirements for RFP and selection of consultant. Technical assistance during task progress and review of results.

Tribe: SWTP overall site and structural assessment and analysis through the Tribally procured consultant.

#### **Task #5 – Life Cycle Cost Assessment**

Under this task the Tribe will utilize technical requirements provided by IHS to procure the services of a consultant selected through the RFP process to develop the projected life cycle cost, including the operation and maintenance burden for each of the major capital improvement alternatives. The results of this task will provide a basis for which the Tribe can plan for operational and staffing needs for the SWTP as well as anticipate needed funds for maintenance, repair, and capital improvements.

Sub-Tasks

- Estimate necessary staffing needs to operate SWTP for each alternative.
- Determine cost of SWTP operations under actual and optimal conditions for each alternative.
- Formulate comprehensive annual budget for SWTP operations for each alternative.
- Determine the life cycle cost of for each alternative.

Deliverable:

IHS: Technical requirements for RFP and selection of consultant. Technical assistance during task progress and review of results.

Tribe: SWTP Operation and Maintenance Plan through the Tribally procured consultant.

**Task #6 – Engineering Project Report**

With involvement and input from the Tribe, IHS will prepare the Engineering Project Report (EPR) which will summarize findings, outline priority improvements, present project alternatives, and illustrate impacts of priority improvements in terms of meeting the SWTR, providing capacity to meet peak demand needs, and economic benefits and impacts of improvements. IHS will provide the EPR and final recommendations utilizing the results and technical review of Tasks 1-5.

Sub-Tasks

- Provide summary of SWTP production data including actual, calculated, and estimated future production needs.
- Provide overview assessment of facility's ability to meet current and future demand as constructed and equipped.
- Present a detailed summary of life cycle costs under current conditions and the proposed capital improvements alternatives.
- Present alternatives for renovation or replacement of the SWTP.
- Recommend immediate low or no cost actions to improve SWTP performance that can be taken by the Tribe and recommend long-term capital improvements for the Tribe to plan and pursue.

Deliverable:

Tribe: Full results of tasks #1-5 and accompanying technical memorandums and/or reports.

IHS: Engineering Project Report.

#### **IV. Project Engineering Support**

The Indian Health Service will provide project engineering support (PES) services. These services will be provided by IHS professional staff and will include the following general categories of activities.

1. Technical Engineering Assistance
  - a. Engineering review of project activity progress
  - b. Engineering review of final product for each task
2. Professional Services Related Engineering and Contract Management Services
  - a. Professional Services Related Technical Engineering Assistance
  - b. Recommendation for acceptance of consultant services based on task scope and requirements
  - c. Recommendation for final acceptance of all task results based on task scope and requirements

Funds to cover the cost of these services will be provided by EPA. These funds will be contributed to IHS as described in the Memorandum of Agreement.

#### **V. Environmental Plan**

The data collected and the results of the above tasks (pre-design activities) will be used to assist the Tribe and/or IHS to provide a more thorough environmental review and determination. The activities under this project development plan are typical IHS technical assistance yet are documented to give the entire project its best chance of success with concrete obligations by the project parties. The existence of a planning project does not assure a construction project.

Therefore, in accordance with the Department of Health and Human Services policies and procedures in General Administration Manual, Part 30, the Council on Environmental Quality regulations at 40 CFR 1500-1508, and procedures of the Indian Health Service published in the Federal Register, Vol. 58, No. 3, Page 569, these project development activities belongs to category of actions "E", which normally do not significantly impact the human environment.

If unanticipated conditions or factors are identified during the course of the project that would affect this determination, work on the affected portion will be halted and the appropriate parties notified. Work on the project or that portion of the work so affected will resume only upon resolution of the problem.

## VI. Risk Management

The following are the primary potential risks or uncertainties associated with this project. The purpose of this planning and design project is to eliminate these uncertainties prior to the Tribe budgeting construction funds.

1. Risk: The facilities plan is focused on the SWTP and does not address the wider issues associated with the distribution system and water storage system.  
Mitigation: The EPR will place the recommended SWTP improvements in context. IHS will continue to discuss other needed O&M improvements through the technical assistance it provides through the Tribal Utility Consultant.
2. Risk: Recommendations to make capital improvements to the SWTP may be beyond the Tribe's resources to implement. Consultant may not properly consider the available resources and may make unrealistic recommendations.  
Mitigation: IHS will prepare the technical requirements of Tasks #1 through #5. These requirements will clearly outline the limits of the consultant's responsibilities. Additionally, the Communications Plan in Section VIII provides for a core team of IHS and Tribal personnel to meet separately to keep the project on track.
3. Risk: Consultant may not have understanding of the funding and project development constraints of EPA and IHS funding programs, resulting in recommendations that may not be compatible, practical, or implementable through these programs.  
Mitigation: IHS will prepare the EPR with Tribal input and involvement to compile and integrate all the project findings and deliverables while ensuring that recommendations made are eligible for and meet EPA and IHS funding and program requirements.
4. Risk: Only a limited field of large firms can provide the full range of procured services described in Tasks #1 through #5.  
Mitigation: Procurement of tasks will be grouped to access appropriately qualified specialty consultants.

## **VII. Task Assignment & Schedule**

The IHS resources committed to this project include: Field Engineer and Project Technical Support. Work is planned to commence upon approval of this development plan. It is of utmost importance that this work be complete before July 2015 so that this design may be added to the SDS inventory.

### **Task Schedule**

Task #1 – Compile Updated and Complete SWTP As-Built/Drawing of Record	July 2014
Task #2 – SWTP Capacity Assessment	September 2014
Task #3 – Mechanical and Electrical Condition Assessment	November 2014
Task #4 – Site and Structural Assessment	January 2015
Task #5 – Life Cycle Cost Assessment	March 2015
Task #6 – Engineering Project Report	May 2015

## **VIII. Communications Plan**

The following includes a list of key project stakeholders. IHS and the Tribe will, at a minimum, conduct project coordination meetings after each of the tasks outlined in the scope of work. If a meeting cannot be scheduled IHS will request updates and reports to be sent to the IHS field office. The IHS Project Manager is responsible for carrying out project communication on behalf of IHS.

### **Confederated Tribes of Warm Springs (CTWS) Contacts**

- Tribal Engineer/Project Manager, CTWS Public Utilities
- Crew Supervisor, CTWS Public Utilities
- SWTP Chief Operator, CTWS Public Utilities
- General Manager, CTWS Public Utilities
- Contract Officer, CTWS Contracting and Purchasing

### **IHS Contacts**

- Tribal Utility Consultant
- Project Engineer
- District Engineer

IHS and the Tribe will conduct meetings both with and independent of the awarded consultant before acceptance of the work of each completed task. The discussions will serve to ensure that the integrity of the project scope is maintained and that the consultant's work is on task with the required deliverables and that the direction of the project is contained within the project scope and the Tribe's needs and capabilities.

## **IX. Procurement Plan**

The Confederated Tribes of Warm Springs will procure the services of specialty service contractors to provide the deliverables of Tasks #1-5 of this project. IHS will develop and provide the RFP to the Tribe for this procurement effort.

Multiple targeted procurements may be sought to keep a direct line of communication between the Tribe and the selected consultant. This will have two desirable effects: 1) reduce complexity of communication and task review by procuring a specialized consultant appropriate for each task and minimizing subcontracting; and 2) provide for progress review upon completion of each task to ensure the integrity of the scope and project are maintained to full project completion.

The following services will be procured through the RFP per Addendum A. Architect/Engineer (A/E) services will be solicited and selected based on qualifications. The services are detailed under the Scope of Work. IHS will work closely with the Tribe in negotiating contract award and providing technical review of the consultant's delivery tasks within the scope of the contract and project.

- Compile Updated and Complete SWTP As-Built/Drawing of Record
- SWTP Production Capacity and Demand Assessment
- Mechanical and Electrical Equipment Assessment
- Overall Site and Structural Assessment
- Life Cycle Cost Assessment

## **X. Quality Design Plan**

In order to control the quality of the planning and design efforts undertaken as part of this project, IHS and the Tribe will complete the following:

- Conduct regular meetings with CTWS Public Utilities, professional consultant, and IHS staff.
- Review proposed findings and conclusions of the tasks, upon completion, to ensure the needs of the Tribe and the Scope of Work are being met.
- Conduct a final review throughout the implementation of and at the end of each task and deliverable to assure all aspects of this project development plan were completed.

## **XI. ADP Data**

Type of Home	E1	H1	E2
Number of Homes	500	130	65
ADP Code* (w,ww,sw)	SZZ	SZZ	SZZ

E1=Indian Housing; H1=HUD Housing; E2=Non-residential units  
SZZ=Engineering Study (No Sewage or Solid Waste Services Provided)

**XII. Cost Estimate and Budget**

Item	Description	Qty	Unit	Unit Cost	Total Cost
1	Update/Complete SWTP Drawing of Existing Facilities	1	LS	\$42,000.00	\$42,000.00
2	SWTP Capacity Assessment	1	LS	\$25,000.00	\$25,000.00
3	Mechanical and Electrical Assessment	1	LS	\$43,000.00	\$43,000.00
4	Site and Structural Assessment	1	LS	\$10,000.00	\$10,000.00
5	Life Cycle Cost Assessment	1	LS	\$5,000.00	\$5,000.00
Professional Services Subtotal					\$125,000.00
Contingency (10%)					\$12,500.00
Professional Services Subtotal					\$137,500.00
Tribal Administration (3%)					\$4,125.00
(Maximum Contribution to Tribe) Tribally Procured Services Total					\$141,625.00
IHS Project Technical Support (10% of Tribally Procured Services Total)					\$14,162.50
IHS Project Engineering Support (6% of Tribally Procured Services Total)					\$8,497.50
Total Project Cost					\$164,285.00
<b>TOTAL PROJECT COST (ROUNDED)</b>					<b>\$165,000.00</b>

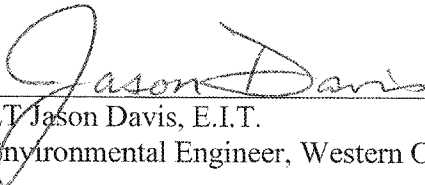
**Total Project Cost (Rounded)                      \$165,000.00**

**Maximum IHS Contribution to the Tribe              \$141,625.00**

**FUNDING SUMMARY**


EPA SDWA Tribal Set-Aside	\$ 71,321.00
IHS Regular	\$ 93,679.00
<b>Total Funds</b>	<b>\$165,000.00</b>

**XIII. Approvals*****Prepared By:***

  
LT Jason Davis, E.I.T.  
Environmental Engineer, Western Oregon Field Office

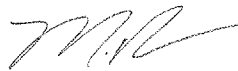
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CDR Craig Haugland, P.E.  
Senior Environmental Engineer, Port Angeles Field Office

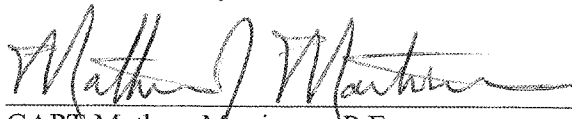
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Date

***Recommended By:***

  
CAPT Mathew Martinson, P.E.  
Acting Director, DSFC, Portland Area Indian Health Service


8/21/13  
Date

***Reviewed By:***

  
LCDR Krista Pihlaja, P.E.  
Area NEPA Coordinator, OEH&E, Portland Area Indian Health Service

8/22/13  
Date

***Approved By:***

  
Mr. Richard R. Truitt, P.E.  
Associate Area Director, OEH&E, Portland Area Indian Health Service

8/22/13  
Date